CONSTRUCTION AND VALIDATION OF NUTRITION AND DOPING SCALE FOR THE STAKEHOLDERS OF SPORTS

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ABSTRACT

The proposed study will aim to construct and validate a comprehensive Nutrition and Doping Scale designed explicitly for stakeholders in the sports domain, including athletes, coaches, trainers, and sports administrators. The scale will be developed through a systematic process involving a thorough review of existing literature, expert consultations, item generation, and pilot testing. Initially, an appropriate number of items will be created and subjected to content validation by a panel of nutrition, sports science, and anti-doping experts. Subsequently, data will be collected from a diverse sample of sports stakeholders N=1600 to perform exploratory and confirmatory factor analyses. It is anticipated that the final version of the scale will consist of key domains. Reliability testing will be conducted to ensure internal consistency, and construct validity will be evaluated using standard psychometric procedures. The Nutrition and Doping Scale is expected to serve as a valid and reliable tool for assessing the awareness and attitudes of sports stakeholders, ultimately contributing to the development of targeted educational programs and policy initiatives that promote ethical and health-conscious practices in sports.

Key Words- Doping, Nutrition, Stakeholders, Questionnaire

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Chapter- I

INTRODUCTION

For many years, the prolife ratio of literature relating to various aspects of sports nutrition has been growing. In more recent years, attention has turned toward finding nutritional behaviours that will produce a "competitive edge" in human performance. Coaches and athletes know that agility, endurance, great reflexes, speed, and strength enhance athletes' physical condition. However, the human body needs the best nutrition to be fully trained for athletic success. Optimal year-round nutrition practices directly influence mental and physical capabilities as a finer point of athletic training. Some daily dietary habits can eliminate nutritional deficiencies, which may impede maximal performance potential. Such a diet should commonly consist of adequate caloric intake from six nutrient groups: carbohydrates, fats, proteins, minerals (and electrolytes), vitamins, and water (Clark,1990).

Some athletes ignore diet, and others possess unreliable information. Student-athletes seeking nutrition advice deserve physical educators/ coaches who can accurately fulfil that responsibility (Parr, Porter & Hodgson,1984; Pujol & Godsey,1990). A mentor with fact-based knowledge can counsel student-athletes on the importance of nutrition for fuelling active people. It is generally accepted that serious athletes who know, leading to efficient skills execution and performance, will utilize it when making food/ hydration choices (Douglas & Douglas, 1984; Parretal, 1984; Perron & Endres, 1985).

The World Anti-Doping Agency (WADA) defines doping as the occurrence of one or more of the antidoping rule violations (ADRVs) outlined in Article 2.1 through Article 2.10 of the WADA Code. There are several ADRVs listed, and a doping offence occurs when a sportsperson tests positive for a banned substance, irrespective of the manner of ingestion. There are several incidences of intentional use of prohibited substances amongst elite sportspersons, but a significant number of cases are of accidental ingestion. Several disciplinary hearing panels of National Anti-Doping Organisations (NADO) have agreed to the offence being due to accidental ingestion. The following reasons contribute to these cases of inadvertent use of prohibited substances:

1. Presence of prohibited substances in common over-the-counter medications.

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2. Improper labelling of supplements.
3. Contamination of supplements.
4. Negligence in checking of ingredients by the sportspersons and the athlete support personnel.
5. Ignorance of antidoping rules.

The National Anti-Doping Agency (NADA) is the WADA-accredited NADO for India, responsible for the conduct of all antidoping activities. NADA collected 2888 urine samples and 288 blood samples between April 2016 to March 2017, and 60 ADRVs were reported.

India had 117 dope offenders and ranked 3 amongst all countries with ADRVs in the year 2015 as per the WADA doping violation report published in 2017.

Questionnaire Development

Questionnaires are used in sample surveys or concerns to elicit reports of facts, attitudes and other subjective states. Questionnaires may be administered by interviews in person or by telephone, or they may be self-administered on paper or another medium, such as audio cassette or the internet. Respondents may be asked to report about themselves, others in their household, or other entities, such as businesses. Researchers use the questionnaire to obtain information by asking participants to respond to questions rather than by observing their behaviour.

For the most part, questionnaire construction has remained more an art than a science. In recent decades there have been infusions of theory from relevant disciplines, such as evaluation techniques have grown more comprehensive and informative, and knowledge about questionnaire design effects and their causes has cumulated. These developments are beginning to transform survey questionnaire construction from an art to a science. A questionnaire is said to be standardized when each respondent is to be exposed to the same questions and the same system of coding responses. The aim here is to try to ensure that differences in responses to questions can be interpreted as reflecting differences among respondents, rather than differences in the processes that produced the answers. Standardized questionnaires are often used in the field of educational planning to collect information about various aspects. Among

the types of information that can be collected by means of a questionnaire are facts, activities, level of knowledge, opinions, expectations and aspirations, membership of various groups, and attitudes and perceptions.

The utility of asking the same questions across a broad group of people to obtain comparable information from them has been appreciated at least since 1086, when William the Conqueror surveyed the wealth and landholdings of England using a standard set of inquiries and compiled the results in the "Domesday Book". Sophistication about survey techniques has increased vastly since then, but fundamental insights about questionnaires have advanced less during the millennium than might have been hoped. The first theoretical perspective to standardize a questionnaire is to operationalise the measurement constructs, i.e., the goal is to present a uniform stimulus to respondents so that their responses are comparable. (Schwarz, N. and Sudman, S.(eds.) (1996)).

Questionnaire Designing

Research showing that small changes is question wording or order can substantially affect responses has reinforced the assumption that questions must be asked exactly as worded, and in the same order, to produce comparable data. A second theoretical perspective was stimulated by efforts to apply cognitive psychology to understand in survey of health and crime. A respondent must perform a series of cognitive tasks in order to answer a survey question. He or she must comprehend and interpret the question, retrieve relevant information from memory, integrated the information, and respond in the terms of the question. At each stage, errors may be introduced. Dividing the response process into components has provided a framework for exploring response effects and has led to new strategies for questioning. However, there has been little research demonstrating that respondents actually engage in the hypothesised sequence of cognitive operations when they answer questions, and the problem of retrieval that stimulated the application of cognitive psychology to survey methodology remains nearly as difficult as ever.

Constructing a questionnaire involves many divisions, such as the wording and ordering of questions, selection and wording of response categories, formatting and mode of administration of the questionnaire, and introducing and explaining the survey. Although

designing a questionnaire remains an art, increasing knowledge is available to inform these divisions. Although respondents often seem to pay scant attention to survey questions or instructions, they are often exquisitely sensitive to subtle changes in words and syntax. Question wording effects speak to the power and complexity of language processing; even when respondents are only half paying attention. Question order is the context in which a particular question is asked. Prior questions can influence answers to subsequent questions through several mechanisms. First, the semantic content of a question can influence interpretations of subsequent questions, especially when the subsequent questions are ambiguous. Second, the thoughts or feelings brought to mind while answering a question may influence answers to subsequent ones. Third, following conversational maxims, respondent may interpret questions, so they are not redundant with prior questions.(Elizabeth Martin, Survey Questionnaire Construction, 2006)

The choice and design of response categories are among the most critical delusion about a questionnaire. As noted, a question that offers a choice among alternatives presupposes that one of them is true. This means that respondents are unlikely to volunteer a response option that is not offered; even it might seem an obvious choice. The choice and design of response categories are among the most critical decisions about a questionnaire. Advantage of open questions is their ability to capture answers unanticipated by questionnaire designers. They can provide detailed responses in respondents' own words, which may be a rich source of data. They avoid tipping oil respondents as to what response is normative, so they may obtain more complete reports of socially undesirable behaviors. On the other hand, responses to open questions are often too vague or general to meet question objectives. Closed questions are easier to code and analyze and compare across surveys. When respondents are asked to select only one response, response alternatives must also be mutually exclusive.

Response Scales

Response scales provide a frame of reference that may be used by respondents to infer a normative response. The higher scale led to much higher frequency reports; presumably many respondents were influenced by what they perceived to be the normative or average response in the scale. If there is a strong normative expectation, an open-ended question may avoid this source of bias. Frequently, ordered categories are intended to measure where a respondent

belongs on an underlying dimension (scale points may be further assumed to be equidistant). Careful grouping and labelling of categories is required to ensure they discriminate. Statistical tools are available to evaluate how well response categories perform. Rating scales are more reliable when all points are labelled and when a branching structure is used, with an initial question followed up by a question inviting finer distinctions. Numbers assigned to scale points may influence responses, apart from the verbal labels. Primacy effects are more likely with response options presented visually and recency effects with rural presentation. (Tourangeau, R., Rips, L. J. and Rasinski, K, The Psychology of Survey Response, 2000).

Should "don't know" be offered as an explicit response option? On the one hand, this has been advocated as a way of filtering out respondents who do not have an opinion and those responses might therefore be meaningless. On the other hand, it increases the number of respondents who say, “don’t know,” resulting in loss of data. Scbuman and Presser find that the relative proportions choosing the substantive categories are unaffected by the presence of a "don't know” category, and research by Krosnick and others suggests that offering "don’t know" does not improve data quality or reliability. Apparently, many respondents who take the easy out by saying "don't know" when given, the opportunity can provide meaningful and valid responses. Thus, "don't know" responses are best discouraged.

Visual aids, such as show cards, are useful for communicating response categories respondents in personal interviews. In self-administered questionnaires, the categories are printed on the questionnaire. In either mode, the respondent does not have to remember the categories while formulating a response, but can refer to a printed list. Telephone interviews, on the other hand, place more serious constraints on the number of response categories; an overload on memory probably contributes to the recency effects that can result from auditory presentation of response options. Redesigning questions to branch, so that each part involves fewer options, reduces the difficulty.

Different formats for presenting response alternative in different modes may cause mode biases; on the other hand, the identical question may result in different response biases in different modes, research is needed on this issue, especially as it affects mixed mode surveys. Psychological theory and evidence support several core principles about memory that tire

relevant to survey questionnaire construction: (Sudman, S., Bradburn, N. M., and Schwarz, N. Thinking About Answers, 1996).

a. Autobiographical memory is reconstructive and associative.
b. Autobiographical memory is organized hierarchically
c. Events that were never encoded cannot be recalled
d. Cues that reinstate the context in which an event was encoded aid memory retrieval.
e. Retrieval is effortful and takes time.
f. Forgetting increases with the passage of time due to decay of memory traces arid to interference from new, similar events,
g. The characteristics of events influence their memorability: salient, consequential events are more likely to be recalled than inconsequential or trivial ones.
h. Over time, memories become less idiosyncratic and detailed, and more schematic and less distinguishable from memories for other similar events.
i. The date an event occurred is usually one of its least accurately recalled features.

Effectiveness of Questionnaires

Recent theories explain telescoping in terms of an increase in uncertainty about the timing of older events. Uncertainty only partially explains telescoping, however, since it predicts more telescoping of minor events than of major ones, but in fact the opposite occurs. Because of the serious distortions introduced by failure to recall and by telescoping, survey methodologists are generally wary of “Have you ever….?” –Type questions that ask respondents to recall experiences over a lifetime. Instead, they have developed various questioning strategies to try to improve respondents' recall. In order to improve recall accuracy, questions arc usually framed to ask respondents to recall events that occurred during a reference period of definite duration. Another procedure is to bind an interview with a prior interview, in order to prevent respondents from telescoping in events that happened before the reference period. Another method attempts to make the boundary of the reference period more vivid by associating it with personal or historical landmark events. This can reduce telescoping, especially if the landmark is relevant to the types of events a respondent is asked to recall.

A more elaborate procedure, the event history calendar, attempts to structure flexible questions in a way that reflects the organization of memory and has proved promising, in research by Belly and associates. For many survey questions, respondents may rely on a combination of memory and judgment to come up with answers. When the number of events exceeds 10, very few respondents actually attempt to recall and enumerate each one. Instead, they employ other strategies, such as recalling a few events and extrapolating a rate over the reference period, retrieving information about a benchmark or standard rate and adjusting upward or downward, or guessing. By shortening the reference period, giving respondents more time, or decomposing a question into more specific questions, questionnaire designers can encourage respondents to enumerate episodes if that is the goal.(Schaeffer, N. C. and Presser, S. 2003).

Survey questionnaire designers aim to develop standardized questions and response options understood as intended by respondents and producing comparable and meaningful responses. In the past, the extent to which these goals were met in practice was rarely assessed. In recent decades, better tools for providing feedback on how well survey questions perform have been introduced or refined, including expert appraisal, cognitive interviewing, behaviour coding, respondent debriefing, vignettes, and split-sample experiments. Another advance is new theoretical perspectives that help make sense of the effects of question wording and context. One perspective examines the cognitive tasks a respondent must engage in to answer a survey question. Another examines the pragmatics of communication in a survey interview. Both have shed light on the response process, although complex problems remain unsolved. In addition, both perspectives suggest limits on the ability to fully achieve standardization in surveys. New theory and pretesting tools provide a scientific basis for decisions about the construction of survey questionnaires.

STATEMENT OF THE PROBLEM

The purpose of the study is to construct and validate a nutrition and doping scale for the stakeholders of sports.

OBJECTIVES OF THE STUDY

- To construct and validate a Nutrition and Doping Scale for stakeholders of sports.
- To compare the nutrition and doping Knowledge among different stakeholders of sports.
- To conduct the test's pilot runs and prepare its final form.
- To establish reliability, validity and norms of the tool.
- To prepare a manual of directions for the future use of the tool.

DELIMITATIONS OF THE STUDY

The study was delimited to the following.

1. The Four Zones of India. (East, West, North and South)
2. Stakeholders will be further delimited as follows:
    a) Athletes of various Games who will have represented his/her state at the national level.
    b) Qualified sports Coaching.
    c) Qualified Physical Education Teachers.
    d) Team Managers/ Sports Administrators who manage the teams at the national level and are involved in administering the sports events.
3. A total of 1600 Subjects will be selected randomly, approximately 400 from each Zone.
4. The age of the subjects will be above 18 years for Athletes, Coaches and Physical Education Teachers and above 25 years for Managers and Administrators.

LIMITATION OF THE STUDY

The effect of extraneous factors that might influence the response of subjects while responding the questionnaire and results of the study, which cannot be controlled, was treated as one of the limitations of the study.

HYPOTHESIS

- There will be no significant difference between the sports stakeholders.
- A standardized scale will be constructed and developed.

DEFINITIONS AND EXPLANATION OF THE TERMS

Nutrition:

Nutrition is defined as the overall process of our organisms from ingesting food to the metabolism, including ingestion, digestion, absorption and transportation, utilising the food to get energy, for growth, repair, and maintenance of our body.

Doping :

The term “doping” refers to the use of prohibited medications, drugs, or treatments by athletes to improve athletic performance.

Athletes:

A person or player who is trained or skilled in practising various sports and games.

Physical education teacher:

The teachers at the secondary and primary levels, commonly known as the P.E.T., who are responsible for the physical activity and psychomotor learning at these levels, are known as physical education teachers.

Coaches :

A coach is a person involved in leading, coaching, and instructing an athlete.

Team Managers :

A person who manages all the documents related to the team during the competition.

Sports Administrators :

A person with a similar range of responsibilities to administrators in other fields usually focuses on organising events and running sports facilities.

Questionnaire:

This type of paper-and-pencil survey is used in descriptive research, in which information is obtained by asking participants to respond to questions rather than by observing their behaviour. (Quantitative research methods in educational planning Series editor: Kenneth N. Ross)

Standardization:

A questionnaire is said to be standardized when each respondent is to be exposed to the same questions and the same system of coding responses. (Elizabeth Martin, Research Report Series, Survey Methodology)

SIGNIFICANCE OF THE STUDY

- It will be helpful to know the nutrition Knowledge of stakeholders of sports.
- It will be helpful in making awareness amongst the various stakeholders of sports in terms of Nutrition Knowledge for their performance.
- It will be helpful to know the Doping Knowledge of stakeholders of sports.
- It will help raise awareness amongst the various sports stakeholders in terms of Doping Knowledge for their performance.
- It will be helpful for the curriculum designer personnel to make appropriate changes/adjustments to the curriculum as suggested by the study.
- It will be helpful for the research scholars to use the questionnaire and carry on their research work.

Chapter- II

REVIEW OF RELATED LITERATURE

K Parmenter, J Wardle (1994) Developed a reliable and valid questionnaire to provide a comprehensive measure of the nutritional knowledge of UK adults. The instrument will help to identify areas of weakness in people's understanding of healthy eating and will also provide useful data for examining the relationship between nutrition knowledge and dietary behaviour which, up until now, has been far from clear. **Design:** Items were generated paying particular attention to content validity. The initial version of the questionnaire was piloted and assessed on psychometric criteria. Items which did not reach acceptable validity were excluded, and the final 50 item version was administered to two groups differing in nutritional expertise on two occasions to assess the construct validity and test-retest reliability. **Subjects:** Three hundred and ninety-one members of the general public, recruited via their places of work, completed the questionnaire at the piloting stage. The final version was administered to 168 dietetics and computer science students following a university lecture. **Results:** The internal consistency of each section was high (Cronbach's alpha = 0.70-0.97) and the test-retest reliability was also well above the minimum requirement of 0.7. Nutrition experts scored significantly better than computer experts [$F(1167) = 200.5$, $P<0.001$], suggesting good construct validity. **Conclusions:** The findings demonstrate that the instrument meets psychometric criteria for reliability and construct validity. It should provide a useful scale with which to reassess the relationship between knowledge and dietary behaviour.

Richard Bukenya et all (2017) This study sought to develop and validate a general nutrition knowledge questionnaire (GNKQ) for Ugandan adults. The initial draft consisted of 133 items on five constructs associated with nutrition knowledge: expert recommendations (16 items), food groups (70 items), selecting food (10 items), nutrition and disease relationship (23 items), and food fortification in Uganda (14 items). The questionnaire validity was evaluated in three studies. For the content validity (study 1), a panel of five content matter nutrition experts reviewed the GNKQ draft before and after face validity. For the face validity (study 2), head teachers and health workers ($n = 27$) completed the questionnaire before attending one of three focus groups to review the clarity of the items. For the construct and test-rest reliability (study 3), head teachers ($n = 40$) from private and public primary schools and nutrition ($n =$

52) and engineering (n = 49) students from Makerere University took the questionnaire twice (two weeks apart). Experts agreed (content validity index, CVI > 0.9; reliability, Gwet's AC1 > 0.85) that all constructs were relevant to evaluate nutrition knowledge. After the focus groups, 29 items were identified as unclear, requiring major (n = 5) and minor (n = 24) reviews. The final questionnaire had acceptable internal consistency (Cronbach α > 0.95), test-retest reliability (r = 0.89), and differentiated (p < 0.001) nutrition knowledge scores between nutrition (67 ± 5) and engineering (39 ± 11) students. Only the construct on nutrition recommendations was unreliable (Cronbach α = 0.51, test-retest r = 0.55), which requires further optimization. The final questionnaire included topics on food groups (41 items), selecting food (2 items), nutrition and disease relationship (14 items), and food fortification in Uganda (22 items) and had good content, construct, and test-retest reliability to evaluate nutrition knowledge among Ugandan adults.

Conkle, M.Terence; Tishier, Anne G.(1992) This study assessed the sports nutrition knowledge of current and prospective physical educators/coaches (HPEs) to determine the need for improved education in this area and to compare the nutrition knowledge of HPEs with that of foods and nutrition students (FNSs) and general college students (GENs). A researcher-developed 4-point Likert-type scale, which contained 70 statements, was administered to 58 students representing a cross-section of health and physical education majors enrolled in upper-level major courses, 27 students in 2 upper-level home economics foods and nutrition's courses, and a general group comprised of 20 students of non-health/physical education classes. Statements on the scale assessed nutrition supplementation, fluids and hydration, pre-event nutrition, nutrition composition, nutrition terminology, general nutrition, and nutrition opinion. The dependent variable was sports nutrition knowledge. Frequencies and percentages were computed for all items on the scale. Group mean differences were computed and compared by a one-way analysis of variance. The sports nutrition knowledge of HPEs tested is inferior to standard competency levels. Significantly higher means scores for FNSs were found. Education and information sources for HPEs are insufficient. Currently, interscholastic athletic coaches have little direct control over the dietary behaviors of student-athletes. Five tables are included. (RLC).

Bukenya, R., Ahmed, A., Andrade, J., Grigsby-Toussaint, D., Muyonga, J., & Andrade, J. (2017). This study sought to develop and validate a general nutrition knowledge questionnaire (GNKQ) for Ugandan adults. The initial draft consisted of 133 items on five

constructs associated with nutrition knowledge: expert recommendations (16 items), food groups (70 items), selecting food (10 items), nutrition and disease relationship (23 items), and food fortification in Uganda (14 items). The questionnaire validity was evaluated in three studies. For the content validity (study 1), a panel of five content matter nutrition experts reviewed the GNKQ draft before and after face validity. For the face validity (study 2), head teachers and health workers (n = 27) completed the questionnaire before attending one of three focus groups to review the clarity of the items. For the construct and test-rest reliability (study 3), head teachers (n = 40) from private and public primary schools and nutrition (n = 52) and engineering (n = 49) students from Makerere University took the questionnaire twice (two weeks apart). Experts agreed (content validity index, CVI > 0.9; reliability, Gwet's AC1 > 0.85) that all constructs were relevant to evaluate nutrition knowledge. After the focus groups, 29 items were identified as unclear, requiring major (n = 5) and minor (n = 24) reviews. The final questionnaire had acceptable internal consistency (Cronbach $\alpha > 0.95$), test-retest reliability ($r = 0.89$), and differentiated ($p < 0.001$) nutrition knowledge scores between nutrition (67 ± 5) and engineering (39 ± 11) students. Only the construct on nutrition recommendations was unreliable (Cronbach $\alpha = 0.51$, test-retest $r = 0.55$), which requires further optimization. The final questionnaire included topics on food groups (41 items), selecting food (2 items), nutrition and disease relationship (14 items), and food fortification in Uganda (22 items) and had good content, construct, and test-retest reliability to evaluate nutrition knowledge among Ugandan adults.

Gao Z, Wu F, Lv G, Zhuang X, Ma G. (2021) Nutrition knowledge refers to understanding concepts and processes related to nutrition and health, proven to be an essential determinant of healthy eating. However, partially due to the lack of nutrition knowledge and unhealthy eating patterns, more and more Chinese people face overweight, obesity, and a high risk of suffering from various chronic diseases. This study aimed to develop a general nutritional knowledge questionnaire (GNKQ) in a Chinese context to diagnose and improve nutrition knowledge education for Chinese people. The newly adapted questionnaire was based on the Turkey version of GNKQ, and absorbed dietary recommendations in a Chinese context. It was first validated by four nutrition experts, then tested by eleven volunteers (one public nutritionist, one preventive medicine graduate student, and nine psychology graduate students). Finally, the questionnaire was tested by 278 participants, including 175 adults, to determine internal consistency, content validity, and convergent validity. Moreover, the construct validity

was evaluated by comparing the differences between 50 students in nutrition-related majors and 53 students in nutrition-unrelated majors. The final Chinese version of GNKQ kept 32 questions with 68 items after deleting some questions based on item difficulty and discrimination. The data showed that the overall internal consistency coefficient was 0.885, and the test-retest reliability was 0.769, $p < 0.001$. Students majoring in nutrition had larger scores than in nutrition-unrelated majors. The convergent validity for each demographic variable was consistent with previous studies, such as larger nutrition knowledge scores for females and those with a higher education. Therefore, the revised Chinese version of GNKQ showed good reliability and validity, indicating that it could be an effective tool to assess the nutrition knowledge of Chinese adults.

Serpa S, Leitão J, Marcolino P, Faria N, Ramadas S, Reis C (2001) Constructed the "Questionnaire of Attitudes towards Doping in Sports" (QADS) is an originally Portuguese questionnaire and is based on the theory of planned behavior (TPB)12. It includes four dimensions to evaluate attitudes (7 items), beliefs (5 items), intentions (15 items) and subjective norms (7 items), and its 34 items are scored on a seven-point Likert-type scale ranging from (1) totally disagree to (7) totally agree. The items 2, 4, 5, 11, 13, 19, 25, 30 and 32, must be reversed16. A higher score would mean a more positive attitude towards doping consumption. The QADS was used within the sport context.

Petróczi, A., Aidman, E. V., Hussain, I., Deshmukh, N., Nepusz, T., Uvacsek, M., Tóth, M., Barker, J., & Naughton, D. P. (2010) The Doping Attitudes Questionnaire (Petróczi et al., 2010) was developed to assess athletes' drug and doping behavior, doping attitudes, descriptive norms, social projection, and perceived pressure regarding drug use and doping behavior. The questionnaire included 17 key questions on drug and doping behavior, each rated using a 6-point scale (1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, 6 = strongly agree). Four items (tick-the-box format) assess perceptions that most high performance athletes use performance enhancing substances. Three additional yes/no questions assess whether the athlete has ever used a social drug, felt pressure to use banned substances, or ever used a banned substance. A final question asks for an estimated percentage of other athletes in the sport that have used a banned substance. Psychometric properties pertaining to the questionnaire were not reported at the time of test development.

Chapter- III

PROCEDURE AND METHODOLOGY

PROCEDURE

This chapter discusses the subjects, tools, procedures, and data analysis.

SELECTION OF SUBJECTS

For the titled construction and standardisation of nutrition and doping scale for the stakeholders of sports, a total of 1600 Stakeholders of sports will be selected from four zones of India, East Zone= 400, West Zone = 400, North Zone = 400 and South Zone 400 (Athlete = 400 of National level of different Games, Coaches = 400 who will be qualified sports coaches, Physical education Teachers = 400 who will be qualified teachers, and Team Managers/Sports Administrators = 400 who will be the manager of state teams at national level/ A person who organises events and run sports facilities.). A purposive sampling technique will be used to select the subjects. The age of the subjects will be above 18 years for Athletes, Coaches and Physical Education Teachers and above 25 years for Managers and Administrators.

CONSTRUCTION OF SCALE

Before developing the scale, the investigator will study many books and literature related to the present study. The investigator will also examine existing standardized questionnaires that are extensively used in the Indian context. The scale will be prepared keeping in view the various aspects of Nutrition and Doping with respect to stakeholders of sports. A satisfactory number of items will be arranged after discussion with the supervisor and the most experienced persons in the related field from across India in the following Nutrition and Doping:

- Nutrition
- Doping

CONSTRUCTION OF THE QUESTIONNAIRE

According to Neuman (1997) when a questionnaire is too long, the rate of responses is diminished. A questionnaire must address issues that arise from the contextual effects of answering specific questions before others. A questionnaire has opening, middle and

concluding questions. Opening questions should be pleasant, interesting, and easy to answer so that they help the respondents feel comfortable with the questionnaire.

The scale will be constructed with the consultation of the supervisor and other experienced Persons in the field of sports. Utmost care and seriousness will be employed in the construction of the scale. Considering the maximum coverage of the area all relevant aspects of the Nutrition and doping will be considered. Attempts will be made to write the simple, clear and relevant questions, leaving no room for ambiguity or vagueness. The investigator will avoid long and complex questions, double-barreled questions, leading questions, double negatives, acronyms or abbreviations, words with double meanings, and emotionally slanted questions. The following steps will be followed in the construction of scale:

INITIAL WRITING

Before finalizing the questions, which will be covering all the dimensions of Nutrition and doping will be identified and selected with the help of supervisor and other experienced Persons in the field of sports from different parts of India. The aim of the investigator will be to collect data through survey using Likert scales. The scale then will be sent to experts for their comments and corrections at the initial level.

After receiving the responses and suggestions from the various expert's scale will be modified. Based on expert's consensus the items will be selected in the final questionnaire. The criterion for selection will be:

- Fidelity to the construct
- Clarity
- Redundancy
- Comprehensibility

PRE-TEST

A very important part of the scale construction is to conduct pre-testing. After formulation of the scale to the satisfaction of the supervisor and selected experts, with the inclusion of all the essential items in an organised manner, the scale will be sent for pre testing to the Stakeholders of sports. The purpose of pre-testing will be to discover if the meanings of all items in the scale are clear and well understood by the respondents. This will help to assess if the items are adequate to obtain the desired information.

During the pre-testing the scale will be given to selected experts of the sports field once again. They will be requested to answer the items and critically evaluate the items of the scale and to give their suggestions if any.

REWRITING

In light of the recommendations made as a result of pre-testing, statements will be excluded from the scale if they are not normally distributed, and necessary changes will be made. Finally, items that cover all the antecedents will be selected for the final draft of the scale. The scale will be arranged logically, and each statement will be recorded clearly to enable the subjects to understand and answer those statements without difficulty.

ADMINISTRATION OF THE SCALE

The investigator will use a 5-point Likert-scale format to obtain responses from subjects. The respondents will be asked to indicate their degree of agreement or disagreement by checking one of five alternative response categories ranging from to strongly disagree, disagree, undecided, agree and strongly agree.

COLLECTION OF DATA

The data will be collected from the stakeholders of sports from different zones of India. The data will be collected through Google form, that will be shared by email, WhatsApp and other social media platforms.

STANDARDIZATION PROCESS OF THE SCALE

The standardization process of any scale requires validity, reliability and norms. Following steps will be followed by the investigator to standardize the scale with the help of latest version of SPSS.

ITEM ANALYSIS

Item analysis will be performed at two different stages of the test development. Item analysis basically involves examination of the pattern of responses for each item in order to assess its effectiveness. The results of item analysis permit better interpretation of test results and provide guidance for item revision. Item analysis also indirectly provide feedback to test developer concerning factor related to good and poor items, which can be useful in future test

development, item can be analyzed qualitatively and quantitatively in term of their contact form and statistical properties. Item total Correlation will be applied.

PRINCIPAL COMPONENT ANALYSIS (PCA)

Principal component analysis (PCA) and exploratory factor analysis (EFA) are often referred to collectively as factor analysis. Principal component analysis (PCA) is a mathematical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components.

The number of principal components is less than or equal to the number of original variables. This transformation is defined in such a way that the first principal component has the largest possible variance (that is, accounts for as much of the variability in the data as possible), and each succeeding component in turn has the highest variance possible under the constraint that it be orthogonal to (i.e., uncorrelated with) the preceding components.

Principal components are guaranteed to be independent only if the data set is jointly normally distributed. PCA is sensitive to the relative scaling of the original variables. The results of a PCA are usually discussed in terms of component scores, sometimes called factor scores (the transformed variable values corresponding to a particular data point), and loadings (the weight by which each standardized original variable should be multiplied to get the component score).

The nutrition and doping Scale will be evaluated by Principal Component Analysis with Varimax rotation to assess the initial factor structure. All items will be included in the PCA.

LABELLING OF THE FACTORS

On the basis of commonness, all the factors will be identified and labelled.

RELIABILITY

Kerlinger (1986) indicates that reliability refers to the accuracy or precision of a measuring instrument. Peers (1996) similarly indicates that reliability of measurement refers to the measuring instrument’s ability to yield the same results when a subject is measured under similar conditions.

The reliability of the nutrition and doping scale will be determined by Cronbach's alpha (a). Cronbach's a (alpha) is a coefficient of reliability. It is commonly used as a measure of the internal consistency or reliability of a psychometric test score for subjects of examinees. It was first named alpha by Lee Cronbach in 1951, as he had intended to continue with further coefficients.

Cronbach's alpha will generally increase as the inter correlations among test items increase and is thus known as an internal consistency estimate of reliability of test scores.

VALIDITY

The face and content validity will be determined and examined by the panel of experts who will be experienced professors and experts in the field of sports. Experts will be requested to check the statements for their clarity and asked whether they aren't misunderstood to subjects for face validity. The experts will evaluate the relevance of all items of the scales for content validity. Experts will be asked that they can add items if they consider desirable. The final version of the scale will be approved assuring its content and clarity.

NORMS

The percentile rank of a score is the percentage of scores in its frequency distribution that are the same or lower than it. Percentile ranks are commonly used to clarify the interpretation of scores on standardized tests. For the test theory, the percentile rank of a raw score will be interpreted as the percentages of examinees in the norm group who scored below the score of interest.

The obtained scores will be categorized as to indicate very high, high, average, low and very low levels of nutrition and doping knowledge on the basis of its percentile values.

STATISTICAL TECHNIQUE

The data will be analyzed by using descriptive and inferential statistics, which be factor analysis principal component analysis (PCA), for the comparison between the stakeholders we will use one way ANOVA and for the construction of norms we will use the percentile.

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